ENGG270

Circuits and Devices

S1 Day 2014

Dept of Engineering

Contents

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General Information

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Credit points
3

Prerequisites
12cp including (ELEC166(P) or ELEC170(P) or ENGG150 (P) or ENGG170(P))

Corequisites
MATH133 or MATH136

Co-badged status

Unit description
This unit develops the key skills in basic electronic theory and in aspects of laboratory investigation and reporting procedures. The unit covers modelling of passive and active electric circuit elements, and analysing circuits including these models. For passive circuits, topics covered are: ideal electrical components; energy dissipation and energy storage; Kirchhoff's laws; transient versus steady-state response; first-order and second-order circuits; and simple filters. Devices include voltage and current sources, resistors, capacitors, inductors and ideal operational amplifiers.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

On successful completion of this unit, you will be able to:

Apply fundamentals of circuit analysis in resistive networks with sources

Extract equivalent-circuit models for resistive networks with sources

Apply fundamentals of circuit analysis with energy storage elements and switches

Determine circuit behaviour with sinusoidal input

Use correct engineering techniques in experiments and reports

Assessment Tasks

Name	Weighting	Due
Lab participation & recording	10%	Each week (see iLearn)
Lab reports	20%	3-weekly (see iLearn)
Assignments	20%	See iLearn
Exam	50%	Will appear in exam calendar

Lab participation & recording

Due: **Each week (see iLearn)**
Weighting: **10%**

Practical sessions will start in Week 2. They are compulsory for all students. Their mode will be practical laboratory sessions or tutorials. Most practical sessions will contain both preparation work and laboratory work.
Each student must have a bound notebook to be used as a laboratory/tutorial log (A4 size preferred, graph pages are not required). This logbook should also be used for any preliminary work. It should contain all results recorded during these sessions and student's comments in time order. On the completion of each session, logebook entries must be signed and dated by a tutor. At the end of the semester the logbooks will be collected for final marking.

Food and drink are not permitted in the laboratory.
Students will not be permitted to enter the laboratory without appropriate footwear. Thongs and sandals are not acceptable.

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- Determine circuit behaviour with sinusoidal input
- Use correct engineering techniques in experiments and reports

Lab reports

Due: **3-weekly (see iLearn)**
Weighting: **20%**

Students will prepare individual lab reports for each learning-outcome module (3-weekly) and submit electronically through iLearn. A typical engineering-journal format will be used.

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Assignments

Due: **See iLearn**
Weighting: **20%**

The assignments will be based on the problems in the text book or on the concepts being introduced at each learning-outcome-module. There will be one or two brief assignments in each (3-week) module. They will be posted on iLearn one week before their due date. The submissions should be hand written on paper. Electronic copies will not be accepted under normal circumstances. Students need to include a signed assignment cover sheet with each submission. This does not mean that you may not consult staff or other students, but it does preclude written work that is copied from others.

On successful completion you will be able to:

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Exam

Due: **Will appear in exam calendar**
Weighting: **50%**

The exam will be closed-book and 3 hours. A formula sheet will be provided if necessary.

Students need to get a pass mark on each of the assessment tasks to pass the unit.

On successful completion you will be able to:

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Delivery and Resources

Text Book:

Svoboda & Dorf "Introduction to Electric Circuits", Wiley, 9th or 8th editions, electronic or printed versions.

Required unit materials:

Text book

Lecture notes and notes for practical sessions (available from iLearn)

Bound logbook for all practical sessions

Changes made to previous offerings of the unit:

New module structure is introduced where each module is directly linked to the learning outcomes. Previous offering of the unit was ELEC270 in 2013.

Technology used:

Typical electronic and electrical instruments such as voltage and current sources, voltmeters, ammeters, oscilloscopes, simulation software such as MATLAB, ORCAD, PSpice, and typesetting software such as Latex will be used.

Unit Schedule

The unit is composed of four modules. Each module will run for three weeks and be directly linked to the learning outcomes. Each module will include lectures, laboratory and tutorial sessions, one or two assignments and one laboratory report.

A detailed weekly schedule will be posted on iLearn.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central. Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy http://mq.edu.au/policy/docs/assessment/policy.html

Grading Policy http://mq.edu.au/policy/docs/grading/policy.html

Grade Appeal Policy http://mq.edu.au/policy/docs/gradeappeal/policy.html

Grievance Management Policy http://mq.edu.au/policy/docs/grievance_management/policy.html

Disruption to Studies Policy http://www.mq.edu.au/policy/docs/disruption_studies/policy.html *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the Learning and Teaching Category of Policy Central.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/support/student_conduct/

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- Workshops
- StudyWise
- Academic Integrity Module for Students
- Ask a Learning Adviser

Student Services and Support

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

IT Help

For help with University computer systems and technology, visit http://informatics.mq.edu.au/help/.

When using the University's IT, you must adhere to the Acceptable Use Policy. The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge,

scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Apply fundamentals of circuit analysis in resistive networks with sources
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- Determine circuit behaviour with sinusoidal input

Assessment tasks

- Lab reports
- Exam

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

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Assessment tasks

- Assignments
- Exam

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and

they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcome

- Use correct engineering techniques in experiments and reports

Assessment tasks

- Lab participation & recording
- Assignments

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcome

- Use correct engineering techniques in experiments and reports

Assessment tasks

- Lab participation & recording
- Lab reports